

WE CLAIM:

1. An interface device for connecting SONET/SDH termination devices with payload processing devices,
5 comprising:
 - (a) a receive module operative to receive incoming SONET/SDH signal streams, to recover bit boundaries, and to recover byte and frame alignment by one of using SONET/SDH A1/A2 frame delineation to find both byte and frame boundaries and using 8B/10B coding to find byte boundaries and 8B/10B control characters to find frame boundaries; and
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 - (b) a transmit module operative to scramble STS-48 and STS-51, to one of 8B/10B encode and scramble STS-12, to serialize said SONET/SDH signal streams, convert said SONET/SDH signal streams into outgoing low voltage differential signal (LVDS) levels, and to transmit said SONET/SDH signal streams.
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2. An interface device according to claim 1, wherein said interface device supports 8B/10B encoding of STS-12 at 622.08 Mb/s producing an effective line rate of 777.6 Mb/s.

5 3. An interface device according to claim 1, wherein said interface device supports SONET scrambled coding for STS-12 at 622.08 Mb/s, STS-48 at 2488.32 Mb/s, and STS-51 at 2643.84 Mb/s.

10 4. An interface device according to claim 1, wherein said interface device is operative to test links by inserting and checking PRBS sequences.

5. An interface device according to claim 1, wherein said 15 interface device is operative, with respect to a given link, to individually test an SPE payload of a largest concatenated STS-Nc carried by said link by inserting and checking PRBS sequences.

20 6. An interface device according to claim 1, wherein said receive module comprises multiple receivers and said

interface device is operative to find mutual frame alignment of SONET/SDH frames on said receivers.

7. An interface device according to claim 6, wherein said
5 interface device is operative to divide said receivers into groups which achieve separate mutual frame alignments.

8. An interface device according to claim 6, wherein said receivers allow mutually aligned incoming signals to have
10 differential delay.

9. An interface device according to claim 8, wherein said receivers are operative to allow some signals to entirely skip space-switching stages, while other mutually aligned
15 signals pass through said space-switching stages.

10. An interface device according to claim 1, wherein said interface device supports diagnostic line testing by inserting B1 framing errors at said transmit module and
20 checking said B1 framing errors at said receive module.